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# IDENTIFICATION OF FUNGTIONAL CLUSTER OF EXTRACT PARASITE DUKU (*LORANTHACEAE DEANDROPTHOE SPECIES*) WITH FT-IR SPECTROMETER

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## ABSTRACT

*Identification of organic compounds in the Loranthaceae daendroptoe sp are urgently to be recognize, because it used as the first step to isolation and elucidation organic compounds in this plant and to know mechanism of action as antiproliferative cell. But a study about that is rarely. This study investigate organic compounds in the ektract of leaves Loranthaceae daendropthoe sp in methanol with identification of functional cluster by using FT-IR spectrometer. The outcome is the spectrum and to be compared with correlation charts.This study has proven the presence of functional clusters in the extract of leaves dandropthoe Loranthaceae sp in methanol ie the group of hydroxyl, carbonil, double-link carboxyl and amines.*

***Keywords:*** *Loranthaceae daendropthoe sp., Spectrometer, functional cluster*

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## INTRODUCTION

Plant parasites duku (Loranthaceae deandropthoe sp) has been proved capable of inhibiting the growth of myeloma cells both in vitro and vivo levels in rat experimental animals (Indarawati 1999, Sofaria 2000, Farida 2000). In another study found that 10% lanseum infusum parasite does not cause increase in transaminase enzyme levels and liver rat tissue necrosis. Parasite has been found to contain 20 lanseum type asam amino. Type of amino acid in question is L-Asparagine, L-Threonine, L-Siren, L-Glutamine, L-alanine, Glycn, L-Cystein, L-valine, L-methionine,-isoleucine L, L-tyrosine , L-Phenylalanine, L-Lysine, L-Hystidine, L-Arginine, L-Peoline, L-Hydroxyproline, L-Hydroxylisinne and Ammonia (Sofaria 2006). Suspected that these plants contain organic compounds that could inhibit the growth of abnormal cells that can be used for therapy in malignant diseases, given to this disease is still difficult to treat with existing medications.

Until recently, the examination content lanseum parasite has not been widely applied. It is estimated that parasitic plants such lanseum elements contain a variety of organic compounds. Exploration of organic compound content of these plants is needed as a basis for isolation and identification of nutritious ingredients, as well as basic research in the mechanism of the parasite lanseum inhibit cell proliferation.

Identification of an organic compound can be recognized through the identification of s-functional group held with an infrared spectrometer. Infrared Spectrometer is one of reliable analytical techniques for the identification of organic compounds based on functional group absorption of infrared rays. (Nuswantoro 2004)

To find those things, there should be an investigation to determine functional groups of plant parasites lanseum by analyzing the peak absorption at certain wavelengths by using FT-IR Spectrometer.

## MATERIALS AND METHODS

Research material is leaf extract in methanol parasite of duku. Simplicia parasite of duku (Loranthaceae deandropthoe species) was one year old. All parts of the handicapped is not due to insect bites or other confounding elements. Parasitic plant growing area of South Sumatra area free of plant pests. Parasitic plant parts used are leaves lanseum of a number of provisions of the samples were then done drying and mashed.

This research is an exploratory research that has been conducted in November 2006 until February 2007. Place of research in the department of Pharmaceutical Medicine, natural materials science laboratories and the Laboratory of the Faculty of Pharmacy Airlangga University Joint Elementary.

Plant parasites taken part dried leaves and mashed up into powder. Powders soaked with methanol for 2

hari.Filtrat filtered using a funnel buchner.Filtrat obtained, methanol evaporated with Rotavapor. Then extract flowed with liquid nitrogen.

Samples of dried leaf extract prepared in the form of parasite lanseum pellet in the form of thin films or pasta. Pellets prepared by mixing the sample with KBR and KBR dough 95% and 5% sample. KBR and powder samples Pour into bowls and mortars AGAT crushed until smooth and evenly. Then the sample is inserted into the FT-IR spectrometer and read the results. The result of image spectrum and compared with existing correlation map.

## RESULTS

This research was carried out three-month immersion on the part of medical pharmacology FK UNAIR, the science of natural ingredients and Laboratory FF UNAIR UNAIR base together.

The result of FT-IR spectrometer images obtained are

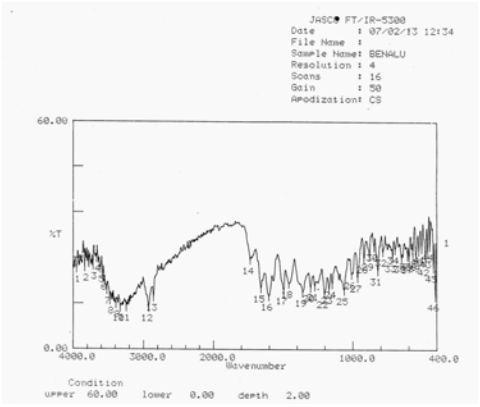


Figure 1. FT-IR Spectrometer Picture Leaf Extract *Loranthaceae daendropthoe sp*.

From these data, the absorption peak can be identified as follows, and customized with ribbon correlation has been determined.

## DISCUSSION

In this research found a variety of maximum absorption peak in the region stretching of hydrogen fibrasi (3700 - 2700 cm-1). Maximum absorption peak in this area caused by stretching vibrations of hydrogen atoms with one another. 4.5.6.7.8.9.10.11 is no absorption peak is the stretching vibration absorption of OH group (hydroxyl) and NH (amine). While in the region 3200-2800 cm-1. climactic No. 12. 13 is an alkane CH stretching vibration region.

Alkanes CH is one of the most simple hydrocarbon compounds. ie hydrocarbons containing only single covalent bonds. Hydrocarbon is a compound of the molecular structure consists of only hydrogen and carbon. While that is a covalent bond is generated by a number of atoms in a joint venture of electrons to achieve stable electron configuration. Examples of these compounds is methane. ethane. propane. butane. and so forth. Naming depends on the number of existing C atoms. such as methane are alkanes that contain only one atom C (CH image). In this research can not be known types of alkanes contained in these plants. Just be aware that these plants contain compounds from alkane groups (Wilbraham et al. 1992).

Table 1. The Peak Absorption of the Leaf Extract *Loranthaceae daendropthoe sp*.

| N0 | Frekuention (cm-1) | N0 | Frekuention (cm-1) | N0 | Frekuention (cm-1) |
|---|---|---|---|---|---|
| 1 | 3950.57 | 2 | 3830.97 | 3 | 3713.30 |
| 4 | 3663.15 | 5 | 3609.14 | 6 | 3576.35 |
| 7 | 3520.41 | 8 | 3476.04 | 9 | 3389.23 |
| 10 | 3329.44 | 11 | 3242.63 | 12 | 2926.28 |
| 13 | 2854.90 | 14 | 1736.09 | 15 | 1658.93 |
| 16 | 1602.99 | 17 | 1496.90 | 18 | 1460.25 |
| 19 | 1359.94 | 20 | 1320.07 | 21 | 1271.20 |
| 22 | 1201.76 | 23 | 1168.97 | 24 | 1145.82 |
| 25 | 1060.94 | 26 | 1006.93 | 27 | 962.57 |
| 28 | 918.20 | 29 | 879.62 | 30 | 846.83 |

Loranthaceae daendropthoe sp. identified also contain organic compounds containing nitrogen that is Amina and amides. this can be expected because of the maximum absorption peak at the NH stretching vibration regions. Amina is an organic derivative of the ammonia. Amine can be called primary. secondary or tertiary depending on the number of groups attached to nitrogen R. Carbon clusters attached to the nitrogen may be aliphatic. aromatic. or both. Amide is a derivative of ammonia and amines from carboxylic acid compounds may be simple (RCONH2). bersubstituen one (RCONHR). bersubstituen two (RCONRR) (Wilbraham et al. 1992).

Compounds containing hydroxyl groups include alcohols. carboxylic acids and esters. In penelitina can not be determined compounds contained in these plants.In a region stretching vibrations of double bonds between the two. namely the frequency of 1950-1550 cm-1 was found two maximum absorption peaks No. 15 and 16. It also marks the peak area stretching vibration

of carbonyl group (C = 0). Force is one of the carbonyl carbon atoms connected by oxygen atoms by double bonds of two. found in aldehyde and ketone compounds. Carbonyl group of organic compounds (carbon that is bound to oxygen) always binds with at least one of hydrogen. this compound is a group of aldehyde (RCHO). Examples of this type is methanal compounds (formaldehyde). etanal (CH3CHO). propanal (CH3CH2CHO) (Wilbraham et al. 1992). Exactly what compounds are contained within the plant so that it still needs further research.

Ketones are organic compounds the carbon-carbonyl carbon connected with two others. Ketone is a stretching vibration region at the peak of 1620-1800 no 15 and 14.

Other compounds that can be identified is the existence of Arena. Because the maximum absorption peak found in areas stretching vibrations of the ring aromatics (1450-1600). the peak number 17 and 18. Arena is a group of compounds of carbon which is often called aromatic compounds because many of them smell nice and mempuinyai benzene ring or equivalent to it. Benzene is the simplest arena has a six-membered carbon ring with one hydrogen attached to each carbon. This causes one electron to form the remaining two double bonds. Struktur dasarnya adalah The structure is essentially

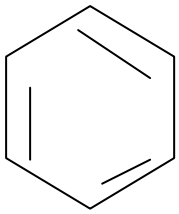

Figure 6. The structure of benzene (Wilbraham et al. 1992).

Other compounds were identified from among carboxylic acids and their derivatives. In the FT-IR spectrometer can be identified based on the maximum absorption peak at the region 2500-3300 cm-1 vibration. 1735-1750 cm-1. Carboxylic acid is the party of organic compounds characterized by a carboxyl group. which is the name that comes from the name of carbonyl and hydroxyl functional groups (-COOH). Functional group is part of a molecule that functions in chemistry. Compounds of this group include formic acid (HCOOH). acetic acid (CH3COOH). While the carboxylic acid esters are derivatives of-OH groups of karboksilnya substituted with-OR group of the alcohol. Containing ester carbonyl group and one ether bond with the carbonyl carbon. The formula generally is RCOOR. R clusters can be either short or long chain. aliphatic (alkyl) or aromatic (aryl). saturated or unsaturated (Wilbraham et al. 1992).

By using the IM spectrometers. each compound will have a characteristic spectrum. Loranthaceae daendropthoe sp may contain various kinds of compounds. so cluster-identified functional groups is likely to be a type of functional groups from a variety of compounds that are owned plants. Therefore. to determine the structure of a compound can not be resolved only with data from the spectrometer so that the need to conduct further research.

Spectrometer capabilities in the identification and analysis could be determined also by the purity of the sample. especially when the sample is in the form of plant extracts which contain various kinds of compounds. Therefore. identification of compounds necessary for a merger between the FT-IR spectrometer with techniques like gas chromatography analysis Chromatrography (GC). High Performance Liquid Chromatography (HPLC). Thin Layer Chromatography (TLC) and Suspercritical Fluid Chromatography (SFC).

## CONCLUSION

Based on the research and discussion. it can be concluded that Loranthaceae daendropthoe sp. containing various kinds of compounds that have a functional group hydroxyl. carbonyl. carboxyl. amine and a double bond.

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